APPENDIX B TO PART 344—FORMULA FOR DETERMINING REDEMPTION VALUE FOR SECURITIES SUBSCRIBED FOR AND EARLY-REDEEMED ON OR AFTER OCTOBER 28, 1996

(a) This formula results in a premium or discount to the issuer depending on whether the current Treasury borrowing rate at the time of early redemption is lower or higher than the stated interest rate of the early-redeemed SLGS security. The total redemption value for bonds and notes can be determined by the following two steps. First, calculate accrued interest payable in accordance with §344.6(d)(1) using the following formula:

$$AI = \left[\frac{(s-r)}{s}\right] x \left(\frac{C}{2}\right)$$

(Equation 14)

Second, calculate the redemption value per §344.6(d)(2) using the following formula:

$$RV = \frac{\left(\frac{C}{2}\right) + \left(\frac{C}{2}\right) a_{n\rceil} + F(v^n)}{1 + \left(\frac{r}{s}\right) x \left(\frac{i}{2}\right)} - AI$$

(Equation 15)

WHERE:	
RV =	Redemption value
F =	Face amount redeemed
AI =	Accrued interest = [(s-r)/s] x (C/2)
r =	Number of days from redemption date to next interest payment date
s =	Number of days in current semi-annual period
i =	Treasury borrowing rate over the remaining term to maturity, based on semi-annual interest payments and expressed in decimals
C =	The regular annual interest
n =	Number of remaining full semi-annual periods from the redemption date to the original maturity date, except that, if the redemption date is an interest payment date, n will be one less than the number of full semi-annual periods remaining to maturity
v^n =	$1/(1 + i/2)^n$ = present value of 1 due at the end of n periods
$a_{n\rceil}$ =	$(1 - v^n)/(i/2) = v + v^2 + v^3 + \ldots + v^n$ = present value of 1 per period for n periods

(b) The application of this formula can be illustrated by the following examples:

(1) The first example is for a redemption at a premium.

(i) Assume that an $800,000 2-year note is issued on December 10, 1996, to mature on December 10, 1998. Interest is payable at a rate of 7% on June 10 and December 10.

(ii) Assume that the note is redeemed on October 21, 1997, and that the current borrowing rate for Treasury at that time for the remaining period of 1 year and 50 days is 6.25%.

(iii) The redemption value is computed as follows. First, the accrued interest payable is calculated as:

$$AI = \left(\frac{183-50}{183}\right) x \left(\frac{\$56,000}{2}\right)$$

(Equation 16)

$$AI = \left(\frac{133}{183}\right) x \$28,000$$

(Equation 17)

$$AI = \$20,349.73$$

(Equation 18)

$$RV = \frac{\left(\frac{\$56,000}{2}\right) + \left(\frac{\$56,000}{2}\right) a_{\overline{n}|} + \$800,000 v^{n}}{1 + \left(\frac{50}{183}\right)\left(\frac{.0625}{2}\right)} - AI$$

(Equation 19)

Then, the redemption value is calculated as:

$$RV = \frac{\left(\frac{\$56,000}{2}\right) + \left(\frac{\$56,000}{2}\right)\left[\frac{1 - \left(\frac{1}{\left(1+\frac{.0625}{2}\right)^2}\right)}{\left(\frac{.0625}{2}\right)}\right] + \$800,000\left[\frac{1}{\left(1+\frac{.0625}{2}\right)^2}\right]}{1 + \left(\frac{50}{183}\right) x \left(\frac{.0625}{2}\right)} - AI$$

(Equation 20)

$$RV = \frac{\$28,000 + (\$28,000)(1.9100092) + (\$800,000)(0.94031221)}{1.008538251} - AI$$

(Equation 21)

$$RV = \frac{\$28,000 + \$53,480.26 + \$752,249.77}{1.008538251} - AI$$

(Equation 22)

$$RV = \frac{\$833,730.03}{1.008538251} - AI$$

(Equation 23)

$$RV = \$826,671.70 - \$20,349.73$$

(Equation 24)

$$RV = \$806,321.97$$

(Equation 25)

(2) The second example is for a redemption at a discount and it uses the same assumptions as the first example, except the current Treasury borrowing cost is assumed to be 8.00%:

(i) Assume that an $800,000 2-year note is issued on December 10, 1996, to mature on December 10, 1998. Interest is payable at a rate of 7% on June 10 and December 10.

(ii) Assume that the note is redeemed on October 21, 1997, and that the current borrowing rate for Treasury at that time for the remaining period of 1 year and 50 days is 8.00%.

(iii) The redemption value is computed as follows.

First, the accrued interest payable is calculated as:

$$AI = \left(\frac{183-50}{183}\right) x \left(\frac{\$56,000}{2}\right)$$

(Equation 26)

$$AI = \left(\frac{133}{183}\right) x \$28,000$$

(Equation 27)

$$AI = \$20,349.73$$

(Equation 28)

Then, the redemption value is calculated as:

$$RV = \frac{\left(\frac{\$56,000}{2}\right) + \left(\frac{\$56,000}{2}\right) a_{n\rceil} + \$800,000v^{n}}{1 + \left(\frac{50}{183}\right)\left(\frac{.0800}{2}\right)} - AI$$

(Equation 29)

$$RV = \frac{\left(\frac{\$56,000}{2}\right) + \left(\frac{\$56,000}{2}\right)\left[\frac{1 - \left(\frac{1}{\left(1+\frac{.0800}{2}\right)^2}\right)}{\left(\frac{.0800}{2}\right)}\right] + \$800,000\left[\frac{1}{\left(1+\frac{.0800}{2}\right)^2}\right]}{1 + \left(\frac{50}{183}\right) x \left(\frac{.0800}{2}\right)} - AI$$

(Equation 30)

$$RV = \frac{\$28,000 + (\$28,000)(1.8860947) + (\$800,000)(0.92455621)}{1.010928962} - AI$$

(Equation 31)

$$RV = \frac{\$28,000 + \$52,810.65 + \$739,644.97}{1.010928962} - AI$$

(Equation 32)

$$RV = \frac{\$820,455.62}{1.010928962} - AI$$

(Equation 33)

$$RV = \$811,585.83 - \$20,349.73$$

(Equation 34)

$$RV = \$791,236.10$$

(Equation 35)

(c) The total redemption value for certificates of indebtedness can be determined by the following two steps. First, calculate accrued interest payable in accordance with §344.6(d)(1) using the following formula:

$$AI = \left[\frac{(d-r)}{y}\right] x\ C$$

(Equation 36)

Second, calculate the redemption value per §344.6(d)(2) using the following equation:

$$RV = \frac{\left(\frac{d}{y}\right) x\ (C) + F}{1 + \left(\frac{r}{y}\right) x\ (i)} - AI$$

(Equation 37)

WHERE:	
RV =	Redemption value
F =	Face amount redeemed
AI =	Accrued interest = [(d-r)/y] x C
d =	Number of days from original issue of the certificate of indebtedness to its maturity date
r =	Number of days from redemption date to the certificate of indebtedness' maturity date
y =	365, if the number of days in the year following issue of the certificate of indebtedness does not include a leap year day; 366, if the number of days following issue of the certificate of indebtedness does include a leap year day
i =	Treasury borrowing rate over the remaining term to maturity, expressed in decimals
C =	The regular annual interest

(d) The application of this formula can be illustrated by the following examples.

(1) First, for a redemption at a premium:

(i) Assume that a $300,000 security is issued on December 5, 1996, to mature in 151 days on May 5, 1997. Interest at a rate of 5% is payable at maturity.

(ii) Assume that the security is redeemed on April 9, 1997, and that the current borrowing rate for Treasury at that time for the remaining period of 26 days is 4.00%.

(iii) The redemption value is computed as follows.

First, the accrued interest payable is calculated as:

$$AI = \left(\frac{151 - 26}{365} \right) x \$15,000$$

(Equation 38)

$$AI = \left(\frac{125}{365} \right) x \$15,000$$

(Equation 39)

$$AI = \$5,136.99$$

(Equation 40)

Then, the redemption value is calculated as:

$$RV = \frac{\left(\frac{151}{365}\right) x \$15,000 + \$300,000}{1 + \left(\frac{26}{365}\right)(.0400)} - AI$$

(Equation 41)

$$RV = \frac{\$6,205.48 + \$300,000}{1.002849315} - AI$$

(Equation 42)

$$RV = \frac{\$306,205.48}{1.002849315} - AI$$

(Equation 43)

$$RV = \$305,335.48 - \$5,136.99$$

(Equation 44)

$$RV = \$300,198.49$$

(Equation 45)

(2) Secondly, for a redemption at a discount:

(i) Assume that a $300,000 security is issued on December 5, 1996, to mature in 151 days on May 5, 1997. Interest at a rate of 5% is payable at maturity.

(ii) Assume that the security is redeemed on April 9, 1997, and that the current borrowing rate for Treasury at that time for the remaining period of 26 days is 6.25%.

(iii) The redemption value is computed as follows.

First, the accrued interest payable is calculated as:

$$AI = \left(\frac{151 - 26}{365} \right) x \$15,000$$

(Equation 46)

$$AI = \left(\frac{125}{365} \right) x \$15,000$$

(Equation 47)

$$AI = \$5,136.99$$

(Equation 48)

Then, the redemption value is calculated as:

$$RV = \frac{\left(\frac{151}{365}\right) x \$15,000 + \$300,000}{1 + \left(\frac{26}{365}\right)(.0625)} - AI$$

(Equation 49)

$$RV = \frac{\$6,205.48 + \$300,000}{1.004452055} - AI$$

(Equation 50)

$$RV = \frac{\$306,205.48}{1.004452055} - AI$$

(Equation 51)

$$RV = \$304,848.28 - \$5,136.99$$

(Equation 52)

$$RV = \$299,711.29$$

(Equation 53)